

SEQUENCE LISTING

<110> Agrinomics, LLC
 <120> Generation of Plants with Improved Pathogen Resistance and Drought Tolerance
 <130> AG03-071C
 <150> US 60/375,333
 <151> 2002-04-24
 <150> PCT/US03/12981
 <151> 2003-04-24
 <160> 18
 <170> PatentIn version 3.2
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 <211> 381
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 <213> Arabidopsis thaliana
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 gctgtcggag ggaaaactgt agaagaagtg aagcgccact atgacattct cgtcgaggat 180
 ctcatcaaca tcgagactgg tcgtgtccct ttgcccaatt acaagacctt cgaatctaac 240
 tcaagaagca tcaatgactt tgacacaagg tatataacta aatatctata tatgatgctc 300
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 <210> 2
 <211> 126
 <212> PRT
 <213> Arabidopsis thaliana
 <400> 2
 Met Ala Ser Asn Ser Arg Ser Ser Ile Ser Pro Trp Thr Phe Ser Gln
 1 5 10 15
 Asn Lys Met Phe Glu Arg Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro
 20 25 30
 Asp Arg Trp His Asn Val Ala Lys Ala Val Gly Gly Lys Thr Val Glu
 35 40 45

Glu Val Lys Arg His Tyr Asp Ile Leu Val Glu Asp Leu Ile Asn Ile
 50 55 60

Glu Thr Gly Arg Val Pro Leu Pro Asn Tyr Lys Thr Phe Glu Ser Asn
 65 70 75 80

Ser Arg Ser Ile Asn Asp Phe Asp Thr Arg Tyr Ile Thr Lys Tyr Leu
 85 90 95

Tyr Met Met Leu Ser Ile Tyr Phe Asp Asn His Ser Ser Asp Phe Glu
 100 105 110

Lys Phe Ser Gln Lys Val Leu Val Ser Tyr Ile Ser Leu Val
 115 120 125

<210> 3
 <211> 98
 <212> PRT
 <213> Brassica rapa

<400> 3

Met Ala Ser Ser Ser Met Ser Ser Ser Trp Thr Ser Lys Gln Asn Lys
 1 5 10 15

Ile Phe Glu Arg Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro Asp Arg
 20 25 30

Trp Gln Asn Val Ala Lys Ala Val Gly Asn Lys Ser Ala Glu Glu Val
 35 40 45

Lys Arg His Tyr Asp Ile Leu Val Glu Asp Leu Met Asn Ile Glu Gln
 50 55 60

Asp Leu Val Pro Leu Pro Lys Tyr Lys Thr Val Asp Val Gly Asn Lys
 65 70 75 80

Ser Arg Gly Ile Asn Gly Tyr Gly Leu Arg Leu Met Lys Asn Ile Glu
 85 90 95

Val Gln

<210> 4
 <211> 75
 <212> PRT
 <213> Vitis vinifera

<400> 4

Met Ala Ser Thr Ser Leu Lys Ser Ser Gly Ser Trp Thr Pro Lys Gln
 1 5 10 15

Asn Lys Leu Phe Glu Lys Ala Leu Ala Leu Tyr Asp Arg Asp Thr Pro
 20 25 30

Asp Arg Trp Gln Asn Val Ala Asn Ala Val Gly Gly Lys Ser Ala Glu
 35 40 45

Glu Val Lys Gln His Tyr Glu Ile Leu Ile Arg Asp Leu Lys His Ile
 50 55 60

Glu Ser Gly Arg Val Pro Ile Pro Asn Tyr Lys
 65 70 75

<210> 5
 <211> 97
 <212> PRT
 <213> Glycine max

<400> 5

Met Glu Ser Cys Ser Ile Ser Ala Ser Gly Ser Trp Ser Val Lys Asp
 1 5 10 15

Asn Lys Ala Phe Glu Lys Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro
 20 25 30

Asp Arg Trp Tyr Asn Val Ala His Ala Val Gly Gly Lys Thr Pro Glu
 35 40 45

Glu Val Lys Arg His Tyr Glu Leu Leu Val Gln Asp Val Lys His Ile
 50 55 60

Glu Ser Gly Arg Val Pro Phe Pro Asn Tyr Lys Lys Thr Thr Ser Glu
 65 70 75 80

Ser Thr Asp Gln Glu Glu Lys Arg Leu Arg Asn Leu Asn Leu Asn Leu
 85 90 95

Gln

<210> 6
<211> 88
<212> PRT
<213> Solanum tuberosum

<400> 6

Met Ala Ser Ser Ser Leu Gln Ser Ser Ser Trp Thr Pro Gln Gln Asn
1 5 10 15

Lys Leu Phe Glu Arg Ala Leu Ala Gln Phe Asp Lys Asp Thr Pro Asp
20 25 30

Arg Trp Gln Asn Val Ala Arg Ala Val Gly Gly Gly Lys Ser Ala Asp
35 40 45

Glu Val Lys Arg His Tyr Glu Ile Leu Ile Glu Asp Leu Lys Arg Ile
50 55 60

Glu Ser Gly Arg Val Pro Leu Pro Thr Tyr Thr His Glu Gln Gln Arg
65 70 75 80

Leu Leu Arg Tyr Met Asn Leu His
85

<210> 7
<211> 71
<212> PRT
<213> Populus tremula

<400> 7

Met Ser Ser Ser His Gln Thr Pro Arg Asn Ser Ser Ser Ser Trp Thr
1 5 10 15

Pro Arg Glu Asn Lys Leu Phe Glu Lys Ala Leu Ala Leu Phe Asp Lys
20 25 30

Asp Thr Pro Asp Arg Trp Lys Asn Val Ala Lys Ala Val Gly Gly Val
35 40 45

Lys Ser Ala Glu Glu Val Lys Arg His Tyr Glu Ile Leu Ile Glu Asp
50 55 60

Leu Lys His Ile Glu Pro Ala
65 70

<210> 8
<211> 88
<212> PRT
<213> Lycopersicon esculentum

<400> 8

Met Ser Ser Met Ser Ser Gln His Gly Ser Ser Gly Ser Trp Thr Ala
1 5 10 15

Lys Gln Asn Lys Ala Phe Glu Lys Ala Leu Ala Val Tyr Asp Lys Glu
20 25 30

Thr Arg Asp Arg Trp Ser Asn Val Ala Lys Ala Val Gly Gly Lys Thr
35 40 45

Ala Glu Glu Val Lys Arg His Tyr Glu Ile Leu Leu Arg Asp Val Phe
50 55 60

Phe Ile Asp Asn Gly Met Val Pro Phe Pro Lys Tyr Lys Thr Thr Gly
65 70 75 80

Gly Ser His Asn Ser Thr Ser Asp
85

<210> 9
<211> 126
<212> PRT
<213> Oryza sativa

<400> 9

Met Ala Ser Ala Ala Gly Ser Lys Gln Gln Gln Ala Met Met Ser Leu
1 5 10 15

Pro Ser Ser Arg Gly Gly Gly Gly Gly Gly Trp Thr Gln Arg Gln Asn
20 25 30

Lys Gln Phe Glu Cys Ala Leu Ala Val Tyr Asp Lys Glu Thr Pro Asp
35 40 45

Arg Trp His Asn Ile Ala Arg Tyr Met Gly Gly Ala Lys Ser Ala Asp

50		55		60
Glu Val Arg Arg His Phe Asp His Leu Val Glu Asp Val Ser Arg Ile				
65		70		75 80
Glu Ser Gly Arg Val Pro Phe Pro Arg Tyr Ser Ser Ser Ser Ser Ser				
	85		90	95
Arg Gly Ala Asp Asp Gly Asn Arg Leu Leu Thr Val Phe His Leu Ser				
	100		105	110
Ser Val Pro Arg Thr Arg Asn Ala Asn His Lys Phe Asn Thr				
	115		120	125
<210> 10				
<211> 236				
<212> PRT				
<213> Oryza sativa				
<400> 10				
Met Ala Gln Gln Ala Arg Ala Gln Trp Pro Gln Lys Gln Asn Lys Leu				
1	5		10	15
Phe Glu Gln Ala Leu Ala Val Tyr Asp Lys Glu Thr Pro Asp Arg Trp				
	20		25	30
His Asn Ile Ala Arg Ala Val Gly Gly Gly Lys Ser Ala Glu Asp Val				
	35		40	45
Lys Arg Tyr Tyr Glu Met Leu Glu Glu Asp Ile Lys His Ile Glu Ser				
	50		55	60
Gly Lys Val Pro Phe Pro Ala Tyr Arg Cys Pro Ala Ala Ala Gly Tyr				
65		70		75 80
Gln Ala Glu Ser Arg Pro Ser Thr Ala Ala Glu Pro Ser Arg Leu Pro				
	85		90	95
Leu Ser Asp Ser Gly Leu Ser Gly Ile Arg Pro Thr Gln Tyr Pro Pro				
	100		105	110
Asp Gly Glu Leu Ser Pro Pro Arg His Arg Leu Arg Arg Arg Gly Asn				
	115		120	125

Gln Pro Ile Pro Ser Tyr Lys Pro Ser Pro Ser Arg Glu Gly Ile Phe
 130 135 140

Tyr Trp Glu Val Val Val Ala Ala Leu Lys Ser Arg Gly Thr Gly Ala
 145 150 155 160

Thr Ser Thr Pro Trp Ile Arg Leu Leu Leu Pro Gly Leu Thr Val Cys
 165 170 175

Arg Leu Leu Gly Ser Ser Gly Cys Phe Asp Ala Trp Met Leu Ser Thr
 180 185 190

Ala Arg Leu Met Val Val Asn Thr Tyr Trp Met Ser Tyr Leu Thr Arg
 195 200 205

Ser Pro Glu Phe His Leu Asn Phe Pro His Ile Asn Leu Arg Lys Tyr
 210 215 220

Glu Val Val Cys Val Gln Pro Gly Phe Met Gln Glu
 225 230 235

<210> 11
 <211> 92
 <212> PRT
 <213> Arabidopsis thaliana

<400> 11

Met Ala Ser Ser Ser Met Ser Ser Ser Ser Ser Trp Thr Ser Lys Gln
 1 5 10 15

Asn Lys Met Phe Glu Arg Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro
 20 25 30

Asp Arg Trp Gln Asn Val Ala Lys Ala Val Gly Ser Lys Ser Ala Glu
 35 40 45

Glu Val Lys Arg His Tyr Asp Ile Leu Val Glu Asp Leu Met Asn Ile
 50 55 60

Glu Gln Asp Leu Val Pro Leu Pro Lys Tyr Lys Thr Val Asp Val Gly
 65 70 75 80

Ser Lys Ser Arg Gly Ile Asp Asp Phe Asp Leu Arg

85

90

<210> 12
 <211> 101
 <212> PRT
 <213> Arabidopsis thaliana

<400> 12

Met Ala Ser Gly Ser Met Ser Ser Tyr Gly Ser Gly Ser Trp Thr Val
 1 5 10 15

Lys Gln Asn Lys Ala Phe Glu Arg Ala Leu Ala Val Tyr Asp Gln Asp
 20 25 30

Thr Pro Asp Arg Trp His Asn Val Ala Arg Ala Val Gly Gly Lys Thr
 35 40 45

Pro Glu Glu Ala Lys Arg Gln Tyr Asp Leu Leu Val Arg Asp Ile Glu
 50 55 60

Ser Ile Glu Asn Gly His Val Pro Phe Pro Asp Tyr Lys Thr Thr Thr
 65 70 75 80

Gly Asn Ser Asn Arg Gly Arg Leu Arg Asp Glu Glu Lys Arg Met Arg
 85 90 95

Ser Met Lys Leu Gln
 100

<210> 13
 <211> 97
 <212> PRT
 <213> Arabidopsis thaliana

<400> 13

Met Ala Ser Ser Ser Met Ser Ser Gln Ser Ser Gly Ser Trp Thr Ala
 1 5 10 15

Lys Gln Asn Lys Ala Phe Glu Gln Ala Leu Ala Thr Tyr Asp Gln Asp
 20 25 30

Thr Pro Asn Arg Trp Gln Asn Val Ala Lys Val Val Gly Gly Lys Thr
 35 40 45

Thr Glu Glu Val Lys Arg His Tyr Glu Leu Leu Val Gln Asp Ile Asn
 50 55 60

Ser Ile Glu Asn Gly His Val Pro Phe Pro Asn Tyr Arg Thr Ser Gly
 65 70 75 80

Gly Cys Thr Asn Gly Arg Leu Ser Gln Glu Glu Lys Arg Tyr Val Leu
 85 90 95

Ser

<210> 14
 <211> 639
 <212> PRT
 <213> Arabidopsis thaliana

<400> 14

Met Ala Ser Ser Ser Met Ser Ser Ser Ser Ser Trp Thr Ser Lys Gln
 1 5 10 15

Asn Lys Met Phe Glu Arg Ala Leu Ala Val Tyr Asp Lys Asp Thr Pro
 20 25 30

Asp Arg Trp Gln Asn Val Ala Lys Ala Val Gly Ser Lys Ser Ala Glu
 35 40 45

Glu Val Lys Arg His Tyr Asp Ile Leu Val Glu Asp Leu Met Asn Ile
 50 55 60

Glu Gln Asp Leu Val Asn Glu Glu Tyr Glu Asn Pro Val Lys Leu Leu
 65 70 75 80

His Asp Val Lys Ile Ala Ile Cys Leu Arg Ile Gln Arg Asp Met Met
 85 90 95

Ala Lys Ile Ser Val Ala Val Leu Leu Ser Val Met Leu Leu Val Ser
 100 105 110

Ile Asn Ser Val Asp Ile Leu Ala Glu Glu Glu Pro Thr Val Gly Gln
 115 120 125

Arg Val Asp Ser Ala Met Thr Ser Val Thr Asp Ala Phe Asn Glu His
 130 135 140

Gly	Gly	Pro	Gln	Ala	Val	Asp	Thr	Val	Ser	Ser	Thr	Phe	Lys	Ser	Val
145					150					155					160
Tyr	Gly	Trp	Phe	Gly	Asp	Lys	Ala	Lys	Tyr	Leu	Glu	Pro	Ile	Ser	Ser
				165					170					175	
Ser	Cys	Cys	Ser	Ser	Ser	Ser	Ser	Ser	Ser	Gly	Glu	Glu	Asn	Thr	Ala
			180						185				190		
Ala	Ala	Asn	Met	Thr	Glu	Met	Glu	Ala	Ala	Glu	Ala	Leu	Ala	Asp	Leu
		195					200					205			
Ala	Gln	Leu	Ala	Ile	Met	Arg	Glu	Gln	Val	Phe	Glu	Ser	Ala	Ala	Ser
	210					215					220				
Trp	Gly	Ser	Lys	Gly	Lys	Arg	Val	Arg	Lys	Arg	Val	Lys	Thr	Glu	Ser
225					230					235					240
Pro	Pro	Ser	Asp	Ser	Leu	Leu	Lys	Pro	Pro	Asp	Ser	Asp	Thr	Leu	Pro
				245					250					255	
Thr	Pro	Asp	Leu	Ala	Glu	Glu	Arg	Leu	Val	Lys	Glu	Glu	Glu	Glu	Glu
			260					265					270		
Glu	Glu	Val	Glu	Pro	Ile	Thr	Lys	Glu	Leu	Thr	Lys	Ala	Pro	Val	Lys
		275					280					285			
Ser	Glu	Ile	Asn	Gly	Glu	Thr	Pro	Lys	Pro	Ile	Leu	Ala	Ser	Thr	Leu
	290					295					300				
Ile	Arg	Cys	Ser	Arg	Ser	Asn	Gly	Cys	Gly	Arg	Ser	Arg	Gln	Asn	Leu
305					310					315					320
Ser	Glu	Ala	Glu	Arg	Glu	Glu	Arg	Arg	Ile	Arg	Arg	Ile	Leu	Ala	Asn
				325					330					335	
Arg	Glu	Ser	Ala	Arg	Gln	Thr	Ile	Arg	Arg	Arg	Gln	Ala	Met	Cys	Glu
			340					345					350		
Glu	Leu	Ser	Lys	Lys	Ala	Ala	Asp	Leu	Thr	Tyr	Glu	Asn	Glu	Asn	Leu
		355					360					365			

Arg Arg Glu Lys Asp Trp Ala Leu Lys Glu Phe Gln Ser Leu Glu Thr
 370 375 380

Ile Asn Lys His Leu Lys Glu Gln Val Leu Lys Ser Val Lys Pro Asp
 385 390 395 400

Thr Lys Glu Pro Glu Glu Ser Pro Lys Pro Ser Gln Val Glu Met Ser
 405 410 415

Thr Ser Ser Thr Pro Phe Tyr Phe Tyr Asn Gln Asn Pro Tyr Gln Leu
 420 425 430

Phe Cys Trp Pro His Val Thr Gln Ser Ser Asn Pro Met Ile Ser Pro
 435 440 445

Leu Glu Phe Pro Thr Ser Gly Gly Ala Ser Ala Lys Thr Ile Thr Thr
 450 455 460

Gln Glu His Glu Asn Ala Ala Asp Asp Asn Gly Gln Lys Thr His Phe
 465 470 475 480

Tyr Val Val Pro Cys Pro Trp Phe Leu Pro Pro Pro Asp His Ser Asn
 485 490 495

Gly Val Pro Phe Gly Leu Gln Asp Thr Gln Arg Gly Thr Phe Ser Asn
 500 505 510

Gly His His Ile Asp Asp Ser Ser Ala Arg Pro Met Asp Val Thr Glu
 515 520 525

Thr Pro Arg Ser His Leu Pro Thr Arg Ile Lys Glu Glu Asp Ser Gly
 530 535 540

Ser Pro Glu Thr Arg Pro Leu Tyr Asp Leu Asn Glu Ser Ala Thr Glu
 545 550 555 560

Val Leu Ser Glu Gly Gly Asp Gly Phe Pro Val Thr Gln Gln Ala Tyr
 565 570 575

Ser Leu Lys His Glu Asp Val Ser Glu Thr Thr Asn Gly Val Thr Leu
 580 585 590

Met Pro Pro Gly His His Val Leu Ile Ser Leu Pro Glu Lys Lys His
595 600 605

Gly Ser Leu Ala Ala Ala Glu Ala Arg Lys Arg Arg Lys Glu Leu Thr
610 615 620

Arg Leu Lys Asn Leu His Gly Arg Gln Cys Arg Met Gln Val Gly
625 630 635

<210> 15
<211> 90
<212> PRT
<213> Oryza sativa

<400> 15

Met Ala Ser Met Ser Val Ser Ser Ser Arg Ala Pro Gln Trp Thr Ala
1 5 10 15

Arg Gln Asn Glu Gln Phe Glu Arg Ala Leu Ala Val Tyr Asp Arg Asp
20 25 30

Thr Pro Glu Arg Trp His Asn Ile Ala Arg Ala Val Ala Gly Lys Ser
35 40 45

Ala Asp Glu Val Lys Leu Tyr Tyr Asp Leu Leu Val Glu Asp Val Lys
50 55 60

Arg Ile Glu Thr Gly Lys Val Pro Phe Pro Ala Tyr Arg Cys Pro Gln
65 70 75 80

Pro Ala Ile Ala Glu Asn Ser Gly Ile Trp
85 90

<210> 16
<211> 101
<212> PRT
<213> Oryza sativa

<400> 16

Met Ser Ser Ser Trp Thr Thr Lys Gln Asn Lys Val Phe Glu Arg Ala
1 5 10 15

Leu Ala Ile Tyr Asp Arg Asp Thr Pro Asp Arg Trp Gln Asn Val Ala
20 25 30

Arg Ala Val Gly Gly Gly Lys Ser Val Asp Asp Val Lys Arg His Tyr
35 40 45

Glu Lys Leu Ile Lys Asp Val Asp Arg Ile Asp Ser Thr Gly Gly His
50 55 60

Gln Gly Ser His Tyr Asn Ser Ser Asn Ala Ser Ser Ser Ser Ser Ser
65 70 75 80

Ser Ser Ser Asn Ser Arg Gly Ser Ala Asn Glu Asp Gln Arg Arg Arg
85 90 95

Tyr His Asn Phe Gln
100

<210> 17
<211> 97
<212> PRT
<213> Lycopersicon esculentum

<220>
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<222> (93)..(93)
<223> Xaa can be any naturally occurring amino acid

<400> 17

Gln Lys Ile Ile Met Ser Ser Met Ser Ser Gln His Gly Ser Ser Gly
1 5 10 15

Ser Trp Thr Ala Lys Gln Asn Lys Ala Phe Glu Lys Ala Leu Ala Val
20 25 30

Tyr Asp Lys Glu Thr Arg Asp Arg Trp Ser Asn Val Ala Lys Ala Val
35 40 45

Gly Gly Lys Thr Ala Glu Glu Val Lys Arg His Tyr Glu Ile Leu Leu
50 55 60

Arg Asp Val Phe Phe Ile Asp Asn Gly Met Val Pro Phe Pro Lys Tyr
65 70 75 80

Lys Thr Thr Gly Gly Ser His Asn Ser Thr Ser Asp Xaa His Tyr Phe
85 90 95

Tyr

<210> 18

<211> 732

<212> DNA

<213> Solanum tuberosum

<400> 18

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ggcggttgga ggtggaaaat ccgccgatga agtaaagaga cactatgaaa tacttattga	180
ggatctcagg cgcattgaat ctggacgtgt tcctcttcct acttacaccc atgaacaaca	240
aaggatattct taatcattct ctttaagtct tttgtccgtt attatttaaa attacaacat	300
tcaaaaagttc tttcaaattc aattggatgg agtgaataaa tatgatattt tttgtttcaa	360
aggaatagca aagtatatat actttgatct tgaacatttt gaaatgtgaa atgagacggt	420
tccatactta aaccctactt tactagtcta tacttttgaa tgagacagtt acatatttct	480
aacttttgtc tatttgtaaa acataagaaa tattcttctc ttttttagaa ttcagttaat	540
atcttctttt caaccttttg ttgtatttta gtcgattcga gtcattgcaa cagttcggat	600
atgaatgaaa tttagaaatc ttaaatttca taaattaaca aaacagacat ggtgcggtgt	660
ttgaaagtta ttgcatgtaa ccctataccc tatttctaatt aagagtcctt aaatctttat	720
tagtatcttt tt	732